City of Seattle
Municipal Stormwater NPDES Permit

2000 Annual Report

Providing an update on the status of stormwater program activities conducted during 2000 with updates, as appropriate, for 2001.

Submitted pursuant to Special Condition S10 of the National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for discharges from municipal separate sewers for the Cedar/Green Water Quality Management Area.

Municipal Stormwater NPDES Permit No. WASM23003

Submitted by:
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August 29, 2001

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2000 Stormwater Management Program Update Report

This report is submitted by the City of Seattle pursuant to Special Condition S10 of the National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for discharges from municipal separate storm sewers for the Cedar/Green Water Quality Management Area. The report covers the 12-month period between January 1, 2000, and December 31, 2000, with updates as appropriate for early 2001.

1. STATUS OF STORMWATER PROGRAM COMPONENTS

All program components have been implemented and are proceeding in accordance with the City's Stormwater Management Program (SWMP), as approved by Ecology on July 24, 1997.

A. COMPREHENSIVE PLANNING PROCESS (S7.B.1)

The following components of the Comprehensive Planning Process include public participation and intergovernmental efforts to coordinate planning issues across city and county levels. The City's planning process currently includes:

Public Participation

Citizen Advisory Committees

Seattle Public Utilities (SPU) has four Citizen Advisory Committees that provide input to SPU staff and the Director on policy and program development:

- Solid Waste Advisory Committee (SWAC)
- Water System Advisory Committee (WSAC)
- Creeks, Drainage and Wastewater Advisory Committee (CDWAC)
- Business Advisory Committee (BAC)

Each committee sets its own work plan and operating procedures with input from staff and is free to work on any issue within their general area of focus. Decision-makers within SPU are briefed on a monthly basis on committee actions and input, and emphasis is placed department-wide on responding promptly to committee recommendations. The membership of each committee includes citizens that may have technical or other background in the subject area, represent relevant stakeholder groups, or contribute to the overall diversity of viewpoints.

The advisory committee most involved with stormwater-related issues is the Creeks, Drainage and Wastewater Advisory Committee (CDWAC). During 1999 and early 2000, the CDWAC was involved in the City's revisions to the Stormwater Code (See Section 1.F). Issues the committee has targeted for the year 2000:

- Endangered Species Act
- Watershed Action Planning
- National Pollution Discharge Elimination System Permitting

- Combined Sewer Overflow Reduction Plan

Carlton Stinson (206) 684-7624

Pipers Creek Watershed Action Plan Implementation Review Committee

The 1990 Pipers Creek Watershed Action Plan for Control of Nonpoint Source Pollution was one of the first watershed action plans in the state. This Watershed Action Plan resulted in Pipers Creek being removed from the list prepared under Section 303(d) of the Clean Water Act for non-attainment of water quality standards. In March 2000, a report on progress and a set of proposed changes to the Plan was issued from a committee of agency representatives and community groups. The Puget Sound Water Quality Action Team recognized the Pipers Creek plan review process as an excellent model for adaptive management of watershed plans.

Of the thirty-nine recommendations in the original plan, 28 have been completed or surpassed and most have left a legacy of ongoing programs. Proposed changes or course corrections include enhanced public education, regulatory, operations/maintenance, public works and monitoring actions, as well as future oversight of the Plan. Many of the new recommendations have already been implemented. Some highlights include:

- The second phase of restoration and erosion control work in Pipers Creek is completed, including the replacement of broken stormwater conveyance pipes in Carkeek Park.
- SPU is contributing resources to develop a new sustainable-designed education and community facility at Carkeek Park.
- Significant progress has been made toward correcting sewer overflows in the city system.
- New Watershed Council and an Education/Outreach committees have been formed.
- A 10-year retrospective report card of accomplishments from the plan for the public is in preparation.

Beth Miller (206) 684-0877

Longfellow Creek Watershed Action Plan and Habitat Restoration Master Plan

Seattle continues to refine, scope and construct projects initiated under the Urban Creeks Legacy Millennium Program. The Longfellow Creek Habitat Restoration Master Plan (Master Plan), the Delridge Neighborhood Plan and the Longfellow Creek Watershed Action Plan all involve extensive public participation. These efforts provide contextual guidance for restoration at a watershed scale. Projects within the Longfellow Creek riparian corridor address public education and access needs, as well as providing habitat and stormwater management improvements.

Capital projects within Longfellow Creek, all at various stages of completion, were recorded by SPU in "Longfellow Creek – An Urban Legacy," a documentary film showcasing City and community efforts to restore Longfellow Creek for salmon habitat. In December of 2000, SPU partnered with the Longfellow Creek Advisory Council and the Admiral Theater in West Seattle to sponsor an extended run of the film through June 2001. Continuous showing of this educational documentary has given the community a unique opportunity to understand first-hand local watershed challenges. Below is an update of significant Longfellow Creek projects:

- 1999 Longfellow Creek Habitat Restoration Project. Erosion Control and Habitat Improvement Measures in Lower Longfellow Creek. Phase A – SW Andover St. to SW Genesee St.

Status: *The first half of 2001 marked the completion of planned improvements for the lower segment of Longfellow, including two new bridge crossings at SW Adams and SW Nevada Streets, an improved culvert outlet at SW Genesee Street, and upland trails and access improvements throughout the Open Space site.*

- West Seattle Golf Course Improvements. Erosion Control and Habitat Improvement Measures in Lower Longfellow Creek. Phase B – SW Genesee St. to SW Brandon St.

  Status: *Project at Conceptual Design Phase. Construction scheduled for 2002. Alternatives will be developed for: (1) fish passage improvements at the SW Genesee inlet structure, Masonry Dam, 12th Fairway culvert, and 3rd Hole culvert; (2) stabilizing slope/streambed, removing sediment deposits, and re-vegetating stream banks with native vegetation within key degraded sections; and (3) a variety of in-stream habitat structures including backwater channels and off-stream ponds for juvenile fish within key degraded sections.*

- Delridge Drainage Basin, Phase II. Channel Improvements from SW Myrtle to SW Graham Streets

  Status: *Final Design Complete. Construction scheduled for 2001-2002. Channel improvements involve removing hydraulic restrictions and enhancing fisheries and riparian habitat at five separate sites located between named street crossings. The site restoration component of this project will construct some parts of a creekside trail system that can later be linked with the Longfellow Creek Legacy Trail.*

- SW Juneau Street Property Acquisition. SPU purchased 1.8 acres of residential creekside property located along the central reach of Longfellow Creek.

  Status: *Property may be used as a neighborhood demonstration site to educate the community about creek-healthy residential stormwater site design practices, and the functional and aesthetic values of linking parcels along the creek methods corridor with native plant buffers. SPU may also opt to use the property as a site to test various urban BMPs.*

The objective of these projects is to help mitigate the effects of urbanization on the natural environment by creating a sustainable system that enhances fish and other wildlife habitat along the riparian corridor as well as within City Open Spaces. The improvements will also help set the stage for increasing stewardship and citizen involvement, such as volunteer monitoring and maintenance, by enhancing and controlling community access.
Ann Beedle (206) 684-7596

Thornton Creek Watershed Action Plan

The Thornton Creek Watershed Management Committee, (WMC) composed of community groups, schools, business leaders and representatives from local, state, and tribal governments, has been contributing since 1997 to develop the Thornton Creek Watershed Action Plan. The plan includes recommendations to improve creek water quality, reduce stormwater flows, improve habitat, and increase environmental education in the watershed. In April 2001 the WMC submitted their preliminary draft plan to SPU and the City of Seattle, who are now reviewing the plan prior to a public review period.

Under guidance from the WMC, SPU published the Thornton Creek Watershed Characterization Report and a Water Quality Assessment in November 2000.

The WMC developed a mission for the watershed Action Plan:

> *To protect and restore the Thornton Creek ecosystem for the welfare of fish, wildlife and people, and to improve the quality of life in the watershed.*

The draft watershed action plan is written to foster the goals shown below. After each goal, a few sample activities are presented.

- **Prevent non-point pollution and improve water quality**. Develop a specific program for residents on ways to be watershed-friendly. Remind individuals about motor oil recycling. Promote natural lawn and garden care. Visit businesses to promote best management practices. Improve the temperature and dissolved oxygen levels in the creek. Build an environmental learning center that promotes watershed stewardship.

- **Reduce flooding and erosion, and maintain or improve base flow, while restoring natural areas.** Create more detention ponds. Develop incentives for residents and businesses to infiltrate storm water. Improve the City of Seattle's and City of Shoreline's capital improvement plan (CIP) projects to incorporate more citizen involvement.

- **Preserve, restore and improve habitat for fish and wildlife.** Plant conifers in local parks. Host creek cleanups and work parties. Create a "native plant" week event. Remove barriers to migrating fish. Strengthen the critical area laws. Identify ways to preserve more open space.

- **Increase public awareness and understanding, and develop stewardship of the watershed.** Use signs and murals. Distribute colorful maps. Bring the watershed into the classroom. Collect habitat data.

- **Prevent further degradation as population and development increase in the watershed.** Support bike lanes and mass transit. Promote environmentally sensitive development. Provide more stewardship opportunities.

SPU anticipates initiating public review of the action plan during winter 2001/02. Approval and adoption of the Plan by the Department of Ecology, Seattle and Shoreline City Councils, and the WMC is expected during spring 2002.
Cary Westerbeck (206) 233-8734

Environmental Grant Funding

Grant Central Station is the City's "one-stop shopping" for environmental grants. Grant Central Station can award as much as $25,000 to fund community projects that reduce waste, protect clean water, remove litter and graffiti, improve public spaces, or involve youth in environmental issues. Grant Central Station is a partnership between two City Departments: Seattle Public Utilities and the Department of Neighborhoods (DON). These departments have combined and redesigned their environmental grant programs to make it easier for applicants. Rather than having to apply for several City grants to fund different parts of a project, it is now possible to receive funding from several sources through one application. The following projects were funded during 2000.

Water Quality Grants

Bilingual Orientation Center (BOC)
The students at the secondary BOC received a grant to support a yearlong study of the Puget Sound and its environments. Four teachers participating in the project planned all instruction to connect to the themes of the Northwest and environmental protection. The students in the program all use English as a second language.

Dunlap Elementary School
The second graders of Dunlap Elementary school received a grant to take fields trips to local P-Patch sites and work with the Master Gardeners to create their own chemical free garden and learn about the importance of water quality, composting. The students will donate the harvest from their garden to a local food bank.

Cooper Elementary School
The new Cooper school was built near a greenbelt in West Seattle and the students have taken an active part in restoring and preserving this natural setting. Cooper Elementary fourth graders received a grant to learn about protecting the natural environment around them. The students are actively working with the community and Seattle Parks Department to survey the existing plant and insect species on the site. After the initial assessment the following class of fourth graders, school and community volunteers will remove all invasive plants and build some new trails to attract more wildlife.

Dearborn Park Elementary School
The students of Dearborn Park Elementary received a grant to restore and protect a wetland their school was built upon. The students have created a wetland curriculum they use when acting as docents for other schools and community members. The students with the community and the PTSA have removed invasive plants, built trails and an observation deck, and provided informational signage throughout the area to educate people about their wetland and how to care for it.

Bagley Elementary School
The fourth and fifth grade students of Bagley Elementary received a grant to support their new environmental club called "Earth-Savers." Their goal is to increase environmental awareness in their school and community. Over the past six years, the students of Bagley have built an outdoor classroom and shaped their instruction based on environmental awareness. The students took field trips to Matthews Beach and created demonstration stations to teach the rest of the school about the effects of surface water runoff and the importance of reforestation and habitat protection. The students have created a website using their writing and photos of the project.

El Centro de la Raza
EL Centro de la Raza is a community nonprofit organization that focuses primarily on Hispanic and Latino issues, and is especially geared to those who use English as a second language or are recent immigrants. The group created a partnership with WSU Cooperative Extension, Urban food Gardeners. The groups used the funds to create a demonstration site to educate citizens about composting, pesticide and chemical free gardening, The group created an on-site garden and hosted workshops throughout the year.

Inter-bay P-Patch
Inter-bay P-Patch is one of the largest demonstration sites in the City and is designed to maximize outreach about water quality protection and environmentally friendly gardening. Inter-bay is using

their grant to purchase a digital camera to create a website to provide information about projects throughout the City's network of P-Patches.

Madrona Neighbors Beautification and Awareness
The Madrona Neighbors received a grant to buy natives plants and to provide refreshments for work parties involved in planting trees, stenciling storms drains, and educating their neighbors about pollution prevention in their neighborhood.

Mount Baker Hillside Gardens
The Mount Baker project is a partnership between the Vietnamese, Cambodian communities, SPU, SEATRAN, P-Patch, and the Mount Baker Housing Association. Their grant was used to create a terracing plan for their community garden to eliminate erosion and illegal dumping on the hillside.

Central Area Community Festival (CACF)
SPU partnered with CACF and Home Depot in a three-day event that focused on community stewardship and how local residents can help save our natural resources. The event was held at Garfield High School and the Community Center campus. In partnership with Home Depot, SPU designed an Eco-Village demonstration site with water and energy saving devices and information on environmentally friendly gardening, composting, water quality and other services and volunteer opportunities to protect the environment. The event attracted over 10,000 people, largely people of color, during the three-day event.

Spring Creek Condominium Board
The Spring Creek board received a grant to purchase native plants for the holding pond at Meadowbrook. The group was looking to improve habitat and provide more native vegetation to attract birds and local wildlife while discouraging vandalism in and around the pond area.

Holly Park P-Patch Terracing
The Holly Park Youth Gardening Program received a grant to hire a consultant to work with twenty diverse families of Holly Park and six youth groups in the area. The goal of the project is for the students to work with the consultant to create an environmentally friendly neighborhood garden. The site will be used to teach housing residents the importance of protecting water quality through environmentally friendly gardening methods, including erosion prevention, chemical reduction, and composting.

Seattle Tilth
Seattle Tilth received a grant to host two workshops that focused on backyard composting and natural soil rebuilding. The techniques taught will help protect water quality and protect salmon habitat. The program will encouraged more food waste composting.

Community and Departmental Partnerships

Thornton Creek Project (TCP)
The Thornton creek Project (TCP) is based at North Seattle Community College. TCP works with residents and schools in the Thornton creek watershed to educate and rehabilitate Thornton Creek. The group received a grant to create a curriculum resource for kids in grades 8-12, introducing them to the concepts of ecology and urban ecosystems. The group also developed a brochure and reprinted the *Rudy Book*. The Rudy book is a story, created by students, about a local watershed mouse who takes a trip down Thornton creek and encounters some of the pollution problems along the way.

Pike Place Market

The Pike Place market received a grant to hire a consultant to work with vendors on adopting new environmental policy guidelines for the market place. The market created a manual and a video for new employees. The guidelines included the market's approach to water quality, waste reduction, recycling, and water and energy conservation.

Bradner Gardens Drip Irrigation

SPU and Bradner Gardens Urban P-Patch group formed a partnership to educate residents about drip irrigation. The groups hired a consultant to teach 44 students at the UW Horticulture Center how to install a successful system and show the benefits of the system by installing a system on-site at Bradner Gardens (Mount Baker) as a teaching aid. The program will attract diverse audiences and provide a permanent demonstration site. This program will help reduce water usage and reduce runoff of pesticides and fertilizers.

Sanislo Elementary School

The students of Sanislo, the school's PTSA, DON and the community received a grant from SPU to turn their flooded ten-acre site into a multi-use community park. The funds will be used to remove an old asphalt playground and provide a more natural area. The plan also calls for protecting and rehabilitating a wetland at the site where the original playground was located.

Alternative School #1 Site Council

The Pinehurst community and Alternative School # 1, in partnership with DON, received a grant to turn an old asphalt court into a new grass ball field and play area. The new area will include natural filtration for the area and use more native plants and porous materials on-site for walkways and trails for runoff filtration.

Cedar Park Project

The Cedar Park Community received funding to help develop a two-acre site in the Lake City neighborhood. Local residents, Seattle Parks & Recreation, Seattle Public Schools, and DON partnered to create a safe and environmentally friendly community space. The project is part of Seattle's "Gray to Green" program.

Plumis Park Advocates

The residents of Crown Hill partnered with DON and SPU to turn an open spacer used for illegal dumping into a demonstration site. The site will help educate residents about native plants, surface water management, water conservation, composting, and erosion control.

John Hay Elementary School

The students of John Hay Elementary, the school's PTSA, DON, and SPU partnered to turn their playground and play area into a new and improved grass play area with improved drainage. The group purchased new sod and native plants to make a more natural area.

Cormorant Cove Park

The Beach Drive Shoreline Parks Committee received a grant to convert a barren waterfront site into an environmentally friendly park. The money will be used for shoreline plants to slow down and prevent beach erosion.

Anthony Matlock (206) 386-9746

Intergovernmental Coordination

Interagency Regulatory Analysis Committee

Seattle Public Utilities regularly participates in the Interagency Regulatory Analysis Committee (IRAC). IRAC began in mid-1993 as a forum for state and local regulatory agencies to share their diverse regulatory perspectives. IRAC's mission is to create a more effective and efficient means of protecting the environment, public health and safety through coordination of regulatory agencies. A primary goal of IRAC is to collaborate with other institutions to address gaps, overlap and inconsistencies relating to regulatory issues. One representative of SPU is presently serving on the IRAC Advisory Committee. SPU is also actively involved in three IRAC workgroups: Water Quality and Fire Retardant, Water Quality and Restaurant Grease, and Troublesome Sites.
Ryean-Marie Woods (206) 386-4024

NPDES Municipal Stormwater Permittee Interagency Working Group

The City of Seattle is a regular participant in the NPDES Municipal Stormwater Permittee Interagency Working Group, whose members represent all the NPDES stormwater-permitted jurisdictions in the State of Washington, as well as the Washington State Department of Ecology. The Working Group meets periodically to discuss and coordinate stormwater management programs and NPDES municipal stormwater permit issues. In addition to Ecology and Seattle, other member agencies include City of Tacoma, King County, Snohomish County, Pierce County, Clark County, Washington State Department of Transportation (WSDOT), Ports of Seattle, and Port of Tacoma.
Robert Chandler (206) 684-7597

Lake Union Action Team

SPU currently chairs the Lake Union Action Team (LUAT), which was formed in 1988 as part of Ecology's Urban Bay Action Program. The goals of the Urban Bay Action Program include protecting ecosystems from further degradation, restoring damaged areas, and protecting the beneficial uses of the water body. The Lake Union Action Team is a multi-agency body that supports the goals of the Urban Bay Action Program by coordinating regulatory and source control efforts in the Lake Union drainage basins. Local, state and federal regulators involved with the Lake Union watershed meet on a bimonthly basis. In addition to SPU, members of the Lake Union Action Team include representatives from Seattle Parks and Recreation, Seattle Department of Design, Construction and Land Use, King County Industrial Waste Program, King County Hazardous Waste Program, King County Wastewater Treatment Division, Port of Seattle, Washington State Department of Ecology, Washington State Department of Natural Resources, Washington State Department of Fish and Wildlife, Washington State Department of Transportation, US Environmental Protection Agency, and the US Army Corps of Engineers.
Robert Chandler (206) 684-7597

University of Washington Center for Urban Watershed Management

SPU serves on the advisory panel for the Center for Urban Water Resources Management at the University of Washington, which is one of the region's best resources for research and education in stormwater management-related topics. The Center is funded in part by support received from the Stormwater Technology Consortium, of which the City of Seattle is a member. Other members of the Consortium currently include: King, Snohomish, Spokane, Pierce, and Kitsap counties, and the cities of Bellevue, Olympia, Kent, and Everett. In 2000 SPU provided $10,300 to the Center as a contributing member of the Stormwater Technology Consortium.
Robert Chandler (206) 684-7597

Coordination with other Planning Processes

Drainage Policies—Implementation and Coordination

The City has continued implementation of drainage policies adopted in 1999 by the City Council. These policies directed the City to develop a local drainage program, incorporate water quality, habitat, and neighborhood issues into drainage planning and program delivery, and develop a coordination framework among City Departments to implement these policies. In the past year, the following actions were completed:

- ***Memoranda of Agreement (MOAs)*** were developed with the City's Parks and Transportation Departments to coordinate roles and responsibilities, and funding for key programs and projects. The SPU/Parks Department MOA focuses on management of urban creeks on Parks properties and coordination of projects. The SPU/Transportation MOA focuses on transportation Capital Improvement Projects (CIPs) which involve compliance with the City's Stormwater, Grading, and Drainage Control Code. Both agreements are monitored by executive managers for the involved departments serving on a Joint Executive Team (JET). JET meetings occur monthly to monitor the implementation of the MOAs.

- ***The Drainage CIP program*** has continued development of projects to improve local drainage, address urban creeks, deal with drainage issues in landslide-prone areas, and coordinate projects with emerging issues such as endangered species listings, WRIA issues, and sediment quality.

- ***Urban creek projects*** have included efforts to improve fish passage and habitat. In addition, an inventory of the City's urban creek systems was launched, and a stream and habitat assessment of six creek systems was initiated. Both studies, when completed, will guide future projects and programs.

Terry Kakida (206) 615-0507

ESA Team

The ESA Team coordinates the City's response to the listing of chinook salmon and anticipated listing of bull trout under the Endangered Species Act (ESA). The interdepartmental, city-wide team reports to the Directors of SPU, City Light, SEATRAN, Parks, Design/Construction and Land Use, and to the Mayor's Office. The ESA team focuses on four primary issues: (1) negotiations with National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (USFWS), (2) coordination with the Tri-County effort, (3) regional watershed planning, and (4) development of the City's Salmon research and habitat investments designed to protect and restore Seattle's major aquatic environments. Seattle's urban environment represents generally highly impaired habitats, requiring an adaptive management strategy to determine the best and most scientifically valuable actions to take. The city has continues to encapsulate scientific knowledge in such reports as the *Major Factors Influencing Chinook Populations* (2000) and the *Urban Blueprint for Habitat Protection and Restoration* (2001).

Major Factors Influencing Chinook Populations (2000) presents what is known and not known about how chinook salmon use Seattle's urban environment and provides a scientific basis for evaluating next steps and programs. The study is based on existing sources of information together with a shoreline inventory of salmon habitat conditions along shorelines within the City limits. The study provides a historical context of built environment changes and impacts on salmon, discusses what is known about spatial and temporal distribution of chinook, and population trends. It describes factors that have affected chinook populations and barriers to salmon recovery within the City and within the two watersheds that encompass the City. The report concludes with a relative ranking of the importance of

various factors (including habitat, hatchery, harvest, and ocean conditions) to the decline of chinook salmon. The study also identifies information gaps and scientific research needs.

Urban Blueprint for Habitat Protection and Restoration (2001) fills in some of the gaps in knowledge identified in the above report. It applies a specific scientific method of how to analyze what Chinook need in the aquatic environments they use for migration and rearing within Seattle's built environment. The study thus lays a foundation for investing in pilot projects to further test biological hypothesis and measure biological response, which will allow the city adapt its actions over time and implement restorative action in the most valued manner possible. Seattle has review its methodology and approach with the NMFS Science Center and the regulatory arm of NMFS. Within the framework of the *Urban Blueprint*, Seattle is building a unified inventory of information and a biological assessment database which, in turn, will influence ongoing work to update our shoreline management program, storm water program, and various best management practices through city operations. The study will also help to better design CIP projects.

Based on a March 1999 City Council resolution, the City provided for an Early Action Program. Since the passage of this resolution, the City has increased enforcement resources and redesigned its regulatory process for conditioning development to include biological expertise and early inspection of all development proposals *before* official applications are made. In 2000, the City of Seattle contributed $90,000 towards marking hatchery chinook fish with Water Resource Inventory Area (WRIA) 8 and WRIA 9. The marking of hatchery fish is being completed by the Washington Department of Fish and Wildlife and is an essential first step in assessing wild chinook populations. Hatchery fish dominate the runs in WRIAs 8 and 9. The City is also developing plans to complete an inventory consistent with the draft Shoreline Management Guideline revisions proposed by Ecology. Year 2001 research has focused on chinook juvenile movement through Lake Washington, the Ship Canal and the Locks. Seattle also devoted general fund dollars (as opposed to utility revenue) to marine nearshore chinook research and to a valuable regional project in the Green/Duwamish watershed outside of Seattle's jurisdiction. Currently, the City's ESA Team is focused on describing, through internal and external outreach, the important information contained in the *Urban Blueprint for Habitat Protection and Restoration.*
Martin Baker (206) 684-5984

B. STORMWATER MANAGEMENT PROGRAM PRIORITIES (S7.B.2)

The City is in a constant process of examining unmet needs and developing actions to address them. Many of the results of recent reviews of unmet needs are reflected in the City's Report to Ecology dated September 2, 1999. Throughout 2000, SPU used several methods to identify and prioritize unmet needs, some of which are listed below:

1. The 1995 Comprehensive Drainage Plan, which provides criteria for the selection of Capital Improvement Projects (CIP). Included in these criteria is a water quality component, which evaluates a proposed project in light of water quality needs.

2. The SPU Drainage System Lateral Team (DSLT), which is comprised primarily of upper-management SPU personnel, meets twice monthly to discuss drainage-related issues. One function of DSLT is to identify important drainage needs (e.g., regulatory, CIP, fiscal) located throughout all the branches and divisions within SPU. Once identified, the DSLT develops an approach to address the issue(s) at hand.

3. A City Stormwater Technical Advisory Team, which meets periodically to provide technical review of plans and policies, and to address other issues related specifically to stormwater runoff

management. The group includes City staff from SPU, Department of Design, Construction and Land Use (DCLU), and Seattle Transportation (SEATRAN). By pulling together various City personnel involved with stormwater issues, this group has been a valuable tool in identifying stormwater needs on a City-wide basis. As appropriate, issues identified by the Stormwater Technical Advisory Team are referred to the DSLT for further action recommendations.

4. The Watershed Action Plans (described in this Annual Report under "Public Participation"), which are another vehicle used to identify stormwater-related unmet needs. In this context a watershed approach is used. Watershed Action Plans allow specific needs to be identified as they relate to unique areas of the City.

5. Creeks, Drainage, & Wastewater Advisory Committee (CDWAC, see Section 1.A) reviews stormwater-related issues within the City and provides input to SPU. By delineating key issues and working directly with SPU staff, CDWAC has an instrumental role in the identifying and prioritizing unmet needs.

An update on changes in the status of the high priority unmet needs as described in the listed in the City's last Annual Report is provided in this section.

Evaluation of sediment control at construction sites

In 2000, revisions were made to the City's Stormwater, Grading and Drainage Control Code (Seattle Municipal Code 22.800 – 22.808), which strengthened requirements for site pollution prevention at construction sites.

Mobile business as sources of nonpoint pollution

The City conducts several business-related source control activities, including SPU's Charity Car Wash Program. Additional details are in Section 1.G of this report.

Retrofitting of structural BMPs

The City has a Centennial Clean Water Grant to examine the efficiencies of structural BMPs. In addition, additional BMP evaluation projects are underway in partnership with the UW Center for Urban Water Resources Management. The *Ultra-Urban Stormwater Program* will evaluate the effectiveness of the following innovative CIP projects aimed at improving stormwater quality and drainage under very urbanized conditions:

SEA (Street Edge Alternative) Street - demonstrates natural design alternative to traditional residential street designs of curb, gutter and sidewalk. Construction was finished February, 2001. Monitoring to-date shows that the system is meeting design objectives for stormwater management.

Viewlands Swale – an alternative design to a conventional drainage ditch using swales, weirs and native plantings to manage volume and treat stormwater. Construction is completed, and evaluation shows that the system is meeting water quality and quantity objectives.

Tree Pit Expansion Program - a partnership with SEATRAN to improve drainage through tree pit design and "retrofit." Several sites have been constructed and it appears that this approach has multiple benefits (e.g., tree health, water quality and quantity management, and low-cost). Performance evaluations are currently being developed. Additional project sites will be developed in 2001.

Development of business inspection program

See Section 1.G of this report.

Development of creek restoration program

See Section 8 of this report.

Development of Thornton Creek Watershed Action Plan

See Section 1.A. of this report.

Evaluation of wetland BMP

An innovative monitoring program was initiated in 1999 by SPU to begin evaluating the performance of the Meadowbrook Pond in northeast Seattle. A sampling program is nearing completion. Results to-date show that the pond is able to remove several pollutants of concern from the incoming stormwater and thus acts as a natural treatment mechanism for Thornton creek.

Review of enforcement procedures

SPU is currently developing an enforcement procedures manual for staff inspectors. Scheduled to be completed in early 2002, this manual will describe inspection procedures and record keeping requirements for enforcement cases, as well as the City's enforcement process. To date, a draft of the enforcement process has been developed and is being circulated for internal review. The process includes a civil penalty for one time, relatively minor infractions, and a Notice of Violation for recurring and/or particularly egregious offenses.

Private detention inspection program

Private Detention Inspections are an on-going effort by the City. Additional information on this program can be found in Section 5.C.

C. LEGAL AUTHORITY (S7.B.3)

Adequate legal authority to control discharges to and from Seattle's storm drainage systems has been established and is described in Appendices R-0 and R-1 of the SWMP. In 2000, revisions were made to the City's Stormwater, Grading and Drainage Control Code (Seattle Municipal Code 22.800 – 22.808).

D. MONITORING PROGRAM (S7.B.4)

This section summarizes monitoring activities undertaken by SPU in 2000 and the first 6 months of 2001. Surface water quality sampling provides data on stream flow and stream chemical/biological composition. Sampling events over the course of the year include: storm event sampling, periodic creek water quality sampling, benthic macroinvertebrate sampling, quarterly street waste sampling, and miscellaneous sampling resulting from surface water quality complaints.

Storm event sampling

A storm event is defined as a storm that lasts for a minimum of 4 hours and contributes at least 0.1 inches of rain with an antecedent dry period (less than 0.01 inches of rain) of at least 8 hours. Storm event samples (flow-weighted composite samples) were collected at the following four locations:

- Pipers Creek basin:
  - mouth of Venema Creek
  - Pipers Creek at footbridge downstream of Venema Creek
  - Pipers Creek above orchard
- Longfellow Creek at Graham Street

For the period January 2000 through June 2001, storm samples were collected at the 3 Pipers Creek stations on the following dates (4 storm events sampled at each station):

January 14, 2000
March 22, 2000
August 19, 2000
April 10, 2001

During the same period, samples were collected during the following three storm events at the Longfellow Creek station:

May 19, 2000
June 12, 2000
October 28, 2000

Robert Steele (206) 684-4152

Aquatic Community Assessment Program

The aquatic community assessment program is in its sixth year. In 2000, seventy-two samples of creek benthic macro-invertebrates (small creatures living at the bottom of a creek) were gathered from the substrate of twenty-four sites located in seven Seattle creeks and their tributaries. The samples were collected from Fauntleroy, Longfellow, Pipers, Venema, Ravenna, Schmitz, Taylor, and Thornton Creeks and several of their tributaries. Results from the 1999 and 2000 sampling season have been reviewed. SPU continues to use regionally developed sampling protocol, converting the raw data into the regionally accepted Index of Biotic Integrity (IBI). In general, Seattle's urban streams suffer from low abundance and low variety in aquatic invertebrates. Recent program changes include a review of the information by an environmental statistics firm to identify trends, draw conclusions, and make recommendations on ways to improve the sampling program. A second change is a shift from staff to volunteer sample collection. In 2001, the benthic invertebrate sampling will become a part of Seattle's urban creek volunteer program.
Chris Woelfel (206) 684-7599

CIP Performance Evaluation

In 1999, SPU launched an ambitious long-term CIP monitoring program for creek restoration work. High priority in-stream construction projects are located in Pipers Creek, Thornton Creek, Longfellow Creek, and Taylor Creek. Types of projects to be evaluated include bed and bank stabilization, planting of native species in the riparian zone, fish passage improvements, and off-channel habitat creation. The intent of CIP effectiveness monitoring is to provide information on the level of improvement or protection afforded a water body as a result of the constructed system or BMP. This information will refine stormwater management decisions and advance the benefits gained by strategically investing in the most effective activities and projects.

In 2000, monitoring of baseline conditions was completed for 20 new stations. The team will collected

and analyzed the results from the first year post-construction monitoring at the 23 stations established for projects constructed in 1999. In the summer of 2001, the creek monitoring team added three new projects to their monitoring sites. A prototype of the website to be used for reporting monitoring results has been completed.
Laura Reed (206) 615-0551

BMP Effectiveness Monitoring

The City of Seattle is a participating agency in a project designed to evaluate structural best management practices (BMPs) that remove pollutants from stormwater runoff. With Washington State Department of Transportation (WSDOT) serving as the lead agency, this project will route highway runoff from a section of Interstate 5 into a test facility located in WSDOT right-of-way under I-5 immediately north of the Lake Washington Ship Canal. The runoff will be piped into as many as four installed BMPs (e.g., swirl concentrator, wet vault, filtration-based units), with sampling ports located so that flow rates and chemical concentrations can be determined at entry and exit points in each BMP. After leaving the structure(s), flow will be collected again into a common pipe, routed through a permanently installed BMP to remove or reduce suspended particles, oils, grease and other potential contaminants, before being discharged into the Ship Canal. This is expected to be a long-term monitoring and research project partnership between WSDOT and the City of Seattle for evaluating BMP efficiencies, operating procedures, and maintenance costs. Other participants in the initial project include the Environmental Technology Evaluation Center (EvTEC) of the Civil Engineering Research Foundation (CERF), Concurrent Technologies Corporation (CTC), and the Center for Urban Water Resources Management (CUWRM) at the University of Washington. Sampling protocols, developed by SPU, have been approved and research faculty at the University of Washington have been engaged on the project. Construction of the test facility was completed in 2000 and to date, one of the treatment systems (Jensen vault) has been installed. Preliminary testing of various flow monitoring equipment was conducted in 2001. SPU has agreed to purchase a StormFilter unit to be installed and tested at the facility. The consultant is currently designing the installation. An installation date for the StormFilter unit has not yet been established.
Robert Chandler (206) 684-7597

In-stream Gravel Management Program

Streambed conditions suitable as spawning areas for fish are lacking in many urban creeks. This project, conducted in partnership with UW Center for Urban Water Resources, focuses on evaluating the sources and quality of sediments in creek systems. The results of this assessment will assist SPU staff in determining the appropriate management decisions regarding sediment supply and process.
Darla Inglis (206) 233-7160

E. INFORMATION SUPPORT PROGRAM (S7.B.6)

The City's Information Support program has been implemented per Section 10.6 of the SWMP. The City is committed to maintaining and updating its GIS system throughout the term of the permit and beyond. The City continues to maintain its system of 17 rain gauges and retains all records associated with precipitation, water quality, water quantity, and structural BMPs.

Surface Water Quality Database

SPU staff maintain a Microsoft Access database of all surface water quality complaint investigations, source control business inspections, monitoring and sampling data. This database is updated and backed-up weekly, and is stored indefinitely. The surface water quality database is accessible to all SPU staff.
Beth Schmoyer (206) 615-1636

GIS Support

The history of Seattle's Geographic Information System (GIS) spans over 18 years. Evolving from a small installation in the former Seattle Engineering Department, the City's GIS was originally built to improve the way the City manages and operates its utility infrastructure. Seattle's GIS capabilities are now firmly entrenched within the daily business functions of most City Departments. Available GIS data can be combined to produce a wide variety of maps and/or to perform analysis. The City's GIS is used to inform decision makers and planners, help deliver services to the public, dispatch Police and Fire personnel, and manage City real estate.

The City of Seattle's GIS base map, referred to as the Central Geographic Data Base (CGDB), consists of six GIS databases. These six base layers are the foundation for the City's geographic systems environment and are the shared layers to which all other thematic GIS layers are spatially registered. The CGDB is composed of the legal layer (lots, plots and plats), the survey control layers, Parcels, the Street Network database, Topography and the Orthophoto layer. This set of base layers is accurate to +/- 1 to 2 feet and was constructed using a combination of existing coordinate information, Global Positioning Satellite (GPS) surveys, photogrammetric densification, and calculations based on plat information and other survey data. The result is one of the most spatially accurate set of GIS base layers in the country.

SPU's operational Sewer and Drainage GIS layer contains over four million records representing all sewer and storm drain mainlines and service laterals. It was built over a period of three years from two main information sources: the Side Sewer Cards and the original CADD-based Truck Set maps. Today's system is maintained by a SPU staff of three and produces a variety of hard copy custom and standard map sets (e.g. 200 scale maps, Truck Set maps). City staff have direct access to the data through easy-to-use custom interfaces.

The primary focus for the sewer and drainage GIS in 2000 was on data accuracy. Resources were devoted to address missing or errant mainline data, improve the connection to SPU Infrastructure Management System (IMS), and address the backlog of sewer plat changes. A tremendous amount of changes have been made to the system, but the work is not yet complete. The focus on data accuracy will continue though 2001 and all back logged work is expected to be completed in 2002. Other projects in process are integrating highly detailed CSO data, delivering a desktop source-tracing tool, developing critical drainage tracking tools, and a 200-scale map project. The 200-scale mapping project is a new endeavor that compares the 10-year old, manually drafted 200 scale maps to date contained in the GIS system. These older maps were not used as an original source when the Sewer and Drainage layer was first being developed, but include some mainline projects and detain not currently available in the GIS. *Harvey Kocher (206) 233-0028*

Updating Database Information

Accomplishments in updating the information contained in the City's GIS database includes the following:

- Ditch/Culvert Mapping: a team of interns using Global Positioning System (GPS) technology are helping to develop a city-wide ditch and culvert layer. This project is over 85.0% complete as of July 2000.

- Ditch Typing: With the assistance of the Center for Urban Resources at the University of Washington, the city's ditch system is being categorized by ditch types. Protocols for design, rehabilitation and maintenance will be created for each ditch type to maximize water quality treatment in these systems.

- BMP Mapping: Structural BMPs have been mapped using GPS and a GIS database of these sites now exist. The mapping not only identifies the location and type of BMP but also allows maintenance crews to establish a maintenance schedule for the various sites.

Darla Inglis (206) 233-7160

Precipitation Monitoring

Currently, there are 17 rainfall-monitoring stations located throughout the city. Raingauge 12 (RG#12), located at 34th Ave. and W. Raye street, was not functioning for several months of the year 2000, owing to construction activities and having the raingauge damaged. Two raingauges (RG# 3 and RG#12) were replaced later in June 2000 and were in a trial period to study their data collection accuracy. SPU also upgraded its raingauges at other fifteen sites in late December 2000. The new 17 raingauges are using Cellular Digital Packet Data (CDPD) communication and their data are directly posted in a web site that can be accessed by SPU staffs. No other major upgrades, expenditures, or maintenance were performed in 2000. Table 1 provides average monthly rainfall accumulation. The average annual rainfall accumulation in Seattle in 2000 was 23.26 inches.

Table 1. Average Monthly Accumulations in 2000 in inches

Jan	3.51	Jul	0.41
Feb	4.56	Aug	0.40
Mar	2.38	Sep	0.94
Apr	0.97	Oct	2.74
May	2.36	Nov	2.44
Jun	0.99	Dec	2.48

Hirad Mousavi (206) 615-0826

F. RUNOFF CONTROL FROM NEW DEVELOPMENT (S7.B.8.a)

Revisions to Stormwater, Grading and Drainage Control Code

In July 2000, the City adopted revisions to the Stormwater, Grading and Drainage Control Code http://www.ci.seattle.wa.us/dclu/Codes/sgdccode.htm (Seattle Municipal Code 22.800 - 22.808) bringing the City's regulations for new development in equivalency with Ecology's minimum requirements. The structural requirements for new development became effective in January 2001. To implement the new requirements, the City developed the following four technical manuals, adopting them as Directors' Rules. Several innovations were included in the manuals (noted below) to provide additional options for development in Seattle's ultra urban setting:

- **Flow Control** http://www.ci.seattle.wa.us/dclu/Codes/Dr/DR2000-26.pdf —in addition to standard detention tank, the manual includes impervious surface reduction credit, new bio-engineering technologies and an updated infiltration section.

- **Stormwater Treatment** http://www.ci.seattle.wa.us/dclu/Codes/Dr/DR2000-27.pdf —in addition to the standard technologies, the manual includes a method for approving alternative technologies and has a provision for providing an integrated drainage plan (IDP).

- **Source Control** http://www.ci.seattle.wa.us/dclu/Codes/Dr/dr2000-17.pdf —in addition to the required structural controls for new development, Seattle included operation requirements for all existing discharges.

- **Construction Stormwater Management** http://www.ci.seattle.wa.us/dclu/Codes/Dr/dr2000-16.pdf —this manual includes a checklist for small projects and BMP selection process to assist in meeting the performance based standards outlined in code.

Miranda Maupin 206-386-9133

Stormwater Planning

SPU has launched a stormwater planning effort designed to characterize Seattle's stormwater outfall basins, evaluate alternative water quality improvement strategies, and develop recommendations for the upcoming stormwater management program and regulatory package. An interdepartmental technical advisory committee has been formed to guide the scope of work. An in-house GIS basin delineation update is expected to be finalized, and the basin characterization is expected to begin in September 2001.
Miranda Maupin 206-386-9133

G. Treatment and Source Control Measures (S7.B.8.b)

Per Section WQ-3 of the SWMP, treatment and source control measures have been implemented. The SPU stormwater source control program is carried out by inspecting select businesses to ensure that appropriate best management practices for reducing pollutants in stormwater are implemented. Businesses to be inspected are identified using the standard industrial classification (SIC) system. Only those businesses that are likely to contribute contaminants to stormwater are selected for inspection.

Stormwater Best Management Practices for Direct Dischargers along the Duwamish River

SPU has hired the Environmental Coalition of South Seattle (ECOSS), a non-profit environmental firm, to work with Seattle businesses that directly discharge stormwater to the Duwamish River. Between May and December 2000, ECOSS inspected 70% of the priority businesses (74 out of 108). A report summarizing this work was submitted to Ecology in February 2001. The program was built on the following steps:

1. Define and refine business list

   An initial list of 204 businesses was reduced to 108 priority businesses, which included painting companies, ship builders, metal fabrication and welding companies, auto wreckers, construction companies, container companies, and marinas. Government property, residential locations and office buildings were not considered priorities.

2. Develop rapport with business community

   As a non-profit group, ECOSS needed to negotiate invitations to inspect businesses. They achieved this through reputation, endorsements and promoting an understanding of the City's new stormwater manual.

3. Contact all businesses in the project area

   ECOSS sent letters to all the businesses in the area.

4. Develop inspection protocol

   The protocol involved setting up appointments, conducting on-site inspections, recommending BMPs, providing written materials to assist with BMPs, providing training, and offering follow-up assistance.

5. Inspect businesses

   Between May and December 2000, ECOSS visited 70% of the priority businesses (74 out of

108). ECOSS also inspected 25 sites in the project area, which were not priorities. SPU also requested ECOSS to provide significant assistance to an auto wrecking business, which was slightly outside of the project area. Businesses which did not voluntarily participate were not inspected. The inspection results were documented on field forms.

6. Provide training and materials

   Twelve stormwater training classes were given to select businesses. Classes covered BMPs that coincide with the City's new source control requirements. Classes were specific and tailored to the type of industry receiving each class. The recipient businesses welcomed the training as a part of their NPDES permit. Often attendance was made mandatory by the business hosting the class. An evaluation form was filled out by participants and returned to the business. In addition to the written material handed out during inspections, ECOSS put businesses in contact with the Pollution Prevention Resource Center and the King County Hazardous Waste Program to assist with reduction of pollutants.

7. Conduct follow-up efforts

   During inspections, ECOSS staff would sometimes identify problems needing immediate correction. Often these minor problems would be corrected before the inspection was finished. ECOSS sent a follow-up letter summarizing findings and recommendations (the recommendations were marked to correspond with the Seattle Source Control Manual's BMPs.) Often, ECOSS provided a follow-up phone call to assist with implementation. Evaluation of change at each site was determined by informal observation, phone calls and correspondence. ECOSS kept in contact with businesses assisted and measured progress. ECOSS would re-visit the sites numerous times and receive telephone calls about implementation.

Three interesting anecdotal accounts are listed below.

- One example of a problem was a site that had hazardous waste left behind when the site was vacated. ECOSS called the current owner and notified them of the problem. The owner took action and contracted to have the hazardous waste hauled off. Seven 55- gallon drums and five 5-gallon pails, all containing petroleum products, were removed from the site, eliminating potential stormwater pollution problems, plus possible fire and safety violations.

- A wrecking yard made major improvements. Much of the site runoff has now been re-routed to the sanitary sewer. The fluids and batteries have all been removed from stationary cars. The entire yard has been swept. Stockpiled waste material was properly disposed. Oily outdoor items have been covered. Staff participated in stormwater training and developed a Stormwater Pollution Prevention Plan. The yard owner is working to detain and treat the remaining runoff that discharges to the Duwamish River.

In conclusion, both SPU and ECOSS found the program very successful. ECOSS staff described the program this way, "The work does not cost the business money in the form of consultant's fees, is anonymous, lets the business make choices, takes away the element of confusion, and gives the business a chance to have ownership of the problem. Some businesses fear government. ECOSS is non-threatening and allows the business to pace itself with change."
Chris Woelfel (206) 684-7599

Business Inspection Program

The business inspection program is designed to reduce stormwater pollution by encouraging businesses

to implement appropriate best management and housekeeping practices. The types of activities targeted and appropriate BMPs are described in Table 2. In 2000, SPU focused on establishing inspection procedures and a record keeping system for the overall program. A list of licensed businesses operating in the City of Seattle was obtained from the Washington State Department of Labor and Industries. This list, which includes standard industrial classifications (SIC), is being used as a starting point to identify businesses that need to be inspected. Field inspections were also conducted in 2000 in the Diagonal Avenue storm drain system in response to an oily discharge that was observed in the Duwamish River offshore of the outfall by the Coast Guard in November 1999. To assess the frequency and severity of the oily discharge problem, SPU conducted daily inspections to observe conditions at the outfall and began inspecting businesses operating in the approximately 2-square mile drainage basin. A total of 35 businesses were inspected in 2000 and three potential sources were investigated. Other types of problems identified in the Diagonal Avenue drainage basin are summarized below in Table 3.

Table 2. Best management practices targeted during business inspections

Targeted Activity	BMP information provided/actions taken
Secondary containment	Education on definition, requirements, manufacturing, and/or purchasing of secondary containment
Spill response	Spill prevention. General cleanup procedures Disposal of cleanup materials: hazardous and non-hazardous Contact numbers for reporting spills
Chemical storage	Suitable storage containers and locations Secondary containment, covering
Employee training	Safety training. Spill response and reporting
Outside storage of parts & materials	Proper storage management practices
Vehicle washing	Educate about consequences of discharge, regulatory compliance, and voluntary connection to the sanitary system
Junk disposal	Education regarding impact of stormwater runoff to surface waters. Waste reduction
Solid waste storage	Impacts of runoff from open containers
Storm drain stenciling	Stencil drain with permission of the property owner
Condition/maintenance of private drainage systems (e.g., Catch basins, inlets, and oil/water separators)	Inspect catch basins Educate about purpose and maintenance of catch basins, oil/water separators
Fleet vehicle facilities	Educate about appropriate location for fleet maintenance and fueling, if appropriate
Fueling stations	Educate about secondary containment, spill response.
Street, parking lot sweeping	Educate that sweeping is preferable to washing Proper disposal of sweeping wastes

Table 3. Types of Problems Identified in Diagonal Avenue Drainage Basin in 2000

Type of problem	Number
Catch basins require cleaning	14
Evidence of spills and/or inadequate spill response training	6
Improper vehicle/equipment washing operations	4
Inadequate solid waste storage	3
Improper outdoor work/maintenance activities	2
Illicit discharge to the storm drain	1

Starting in 2001, approximately 2.0 FTE have been assigned to the business inspection program. Development of an *Access* database to track the progress of the inspection program is underway and a prototype is expected to be ready for use by the end of 2001. The list of licensed businesses has also been linked with the City's GIS system and businesses can now be mapped to identify locations relative to drainage basins and receiving water bodies. In addition, four new inspector positions were approved and these new positions are expected to before the end of 2001.

Field inspection activities in 2001 focused on completing the inspections in the Diagonal Avenue South basin and starting inspections in other areas in the City where basin studies are underway, such as Densmore and Norfolk drainage basins. A total of 175 business inspections were completed between January 1 and June 30, 2001, including 77 onsite inspections and 98 drive-by inspections. The types of problems found during onsite inspections are listed below in Table 4.

Table 4. Types of Problems During Inspections

Type of problem	Number
Catch basin needs cleaning	83
Illicit connection	7
Vehicle washing	1
Parking lot washing	0
Automobile-related fluid in catch basin	3
Liquid storage area uncovered	12
Liquid storage area in unsafe location	11
Outside vehicle maintenance	7
Solid waste dumpster	0
Restaurant grease barrel	3
Missing trap on catch basin	1
No spill plan	59
No spill kit/material onsite	54
Total	251

Ryean-Marie Woods (206) 386-4024

SPU Hazardous Material Spill Coordinator/Response Program

In 2000, SPU implemented a Spill Coordinator Program (SCP) to respond to hazardous material spills occurring in the Seattle service area. The role of the spill coordinator is to lead City response activities, including: evaluating hazardous substance spills, deciding how best to mitigate and clean up the spill, mobilization and commitment of SPU resources, and overseeing the activities of a spill response contractor, if needed. Spill coordinators are assigned for a one-week period and are on call 24-hours a day to respond to spills reported through the City's Operations Communications Center (OCC). SCP coverage began in July 2000. Forty-two spills were reported during 2000, 28 of which required a spill

coordinator program response, ranging from telephone consultation to on-site coordination.
John Labadie (206) 684-8311

H. Operations and Maintenance of Stormwater Facilities (S7.B.8.c)

SPU Drainage and Wastewater Operations Division is responsible for drainage system maintenance for culverts, pipes, inlets, catch basins, sand boxes, trash racks, and ditches (mowing and clearing debris). Table 5 and Table 6 describe the different activities that occurred during the 2000.

Table 5. 2000 Quarterly Totals

Main Line Cleaning	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total lineal feet
Hydrocut	683	1872	350	610	3515
Machine Rodded	699	510	1028	705	2942
Jet Cleaning	1550	2276	1403	3932	9161

Main Line TV Inspection	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total lineal feet
TV Line	475	1015	720	1720	3930
Tractor TV Line	12092	30187	62476	43738	148493

Table 6. 2000 Drainage Maintenance

Activity	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Mechanical Clean-Catch basin/Sand box	3371	2163	2761	3416	12845
Manual Clean Inlets	3428	3361	4799	4663	16251
Power Rodding*	1813	1283	2845	3087	9028
Inspect Catch Basin/ Sand Box	3500	9553	12188	6932	32173
Repair/Replace Drain Structure	174	211	195	251	831
Auger Ditch Cleaning	0	22618	29651	60	52329
Maintain Ditches*	31620	85573	79801	71709	268703
Closed circuit TV Inlet/Outlet Pipes*	231	484	478	655	1848
Clean Settling Basins/Ponds	92	65	73	40	270
Jet Cleaning*	17353	24958	15687	17123	75121
Clean Bridge Drains	364	1273	135	2086	3858
Hydrocut*	102	499	38	122	761

** lineal feet*

Pat Gorham (206) 386-9730

I. Operations and Maintenance of Roadways (S7.B.8.d)

Seattle Transportation Department (SEATRAN) Street Maintenance Division has a staff of approximately 80 field and management personnel involved in street sweeping and de-icing. The City has nine sweepers that follow a schedule (weather permitting) of cleaning public streets and roads. Industrial and commercial areas are regularly swept on a rotating basis. Bike paths are cleaned approximately once a month. In addition, roadways known to receive a significant number of leaves receive repeated visits during autumn. Street cleaning crews also respond to emergency calls, for example oil spills on the roadway, which are typically cleaned up with absorbent pads, booms or spag. During winter, the City uses both sand and deicing liquids to aid traffic during freezing weather. Street sweepers are used to pick up any remaining sand after it is no longer required. In 2000, there were approximately 27,000 curb miles of streets swept. Litter control is the responsibility of the SPU Community Services Division, which coordinates a number of volunteer programs to help keep the City's roadways clean, such as Adopt-a-Street, Neighborhood Cleanup, and Spring Clean. Table 7 shows the 2000 SEATRAN Street Maintenance accomplishments and budget for drainage-related work.

Table 7. Selected 2000 expenditures for Street Maintenance

Activity	Accomplishments (Units)	Budget
Mechanical sweeping	27,336 Curb Miles	$1,209,637
Street flushing	6,773 Work Miles	$35,941
Alley flushing	6,932 Alley Blocks	$146,589
Snow & ice response	3,061 Labor Hours	$152,541

Beginning late in 2000 and continuing into 2001, the City of Seattle is assessing whether to implement the proposed Regional Road Maintenance Program and apply to the National Marine Fisheries Service for exemption under Section 4(d) of the Endangered Species Act. As part of this assessment, SEATRAN has compared its standard road maintenance practices to the proposed best management practices. There is a high degree of correlation; where there are differences, SEATRAN standard practices are being aligned with the proposed best management practices.
Jim Dare (206) 684-5319

J. Water Quality Considerations in CIP Projects (S7.B.8.e)

In 2000, SPU constructed several Capital Improvement Program (CIP) projects that included water quality elements. Some of the principal projects are listed below. The dollars shown are for 2000 expenditures. (Although some of these were actually completed in 2001, the majority of work was done in 2000.) Additional information other projects specifically related to creeks can be found in Section 8 of this report.

Thornton Creek Watershed Action Plan - $168,000.
This project was a collaborative effort by City, other agency, community, and business groups to create a plan to restore the Thornton Creek ecosystem and reduce non-point source pollution. The plan, which will be completed in 2001, will be the result of a four-year effort and will identify specific actions for reducing contaminants from the creek. See also Section 1.A. of this report.

Meadowbrook Pond Phase 3 - $249,000.
This project makes improvements to a large detention and settling basin previously constructed by SPU. The revisions are intended to make the facility easier to maintain so that debris is removed from the creek more efficiently.

SEATRAN Tree Pit Expansion - $18,000.
This project constructed tree pits in sidewalks that are longer than usual to provide additional soil for infiltration. A soil mix was designed to enhance infiltration and absorption of runoff from the sidewalk area and capture contaminants. An overflow to the drainage system was provided in areas where the subgrade would not capture all of the flow.

S.E.A. Street Project and Study - $438,000.
An innovative drainage and traffic calming project, the first Street Edge Alternative (SEA) Street was completed in April of 2001. The project reconstructed one block of city street, creating a street that is narrower to reduce impervious surfaces and with extensive landscaping along the edges. The new shoulders provide detention and filtration as well as infiltration of stormwater runoff. The improvements are incorporated into the adjacent properties to provide a street that is more visually pleasing as well as better for water quality. The project has already received numerous awards and was showcased at a Low-impact Development Conference in 2001. A video is being made that will document the project's site selection process, project objectives, community involvement, and stormwater management benefits.

1999 Thornton Creek Restoration (carryover) - $352,000.
This project constructed fish passage, erosion control, bank stabilization, and habitat enhancement work at several locations along Thornton Creek.

2000 Thornton Creek Restoration - $248,000.
This project constructed fish passage, erosion control, bank stabilization, and habitat enhancement work at additional locations along Thornton Creek.

SW Yancy Street Creek Restoration - $2,250,000.
This project constructed the second phase of fish passage, erosion control, bank stabilization, and habitat enhancement work on the lower portion of Longfellow Creek.

For all projects: Neil Thibert (206) 684-7589

K. Reduction of Pesticides, Herbicides, and Fertilizers (S7.B.8.f)

Green Gardening Program
Begun in 1993, Green Gardening is a program developed by SPU and funded by the Local Hazardous Waste Management Program (LHWMP). Green Gardening seeks to educate King County residents and landscape professionals about alternative pest management strategies in an effort to reduce pesticide use. All Green Gardening activities are designed and implemented by the consultant team of the Seattle Tilth Association, Washington Toxics Coalition and Washington State University Cooperative Extension.

In 2000 the Green Gardening consultant team completed ten primary tasks:

1. 1,682 people attended Green Gardening presentations in 2000. These presentations were made to garden clubs, community groups, environmental groups, workplaces and homeowner's associations. In addition, six presentations were translated for Cambodian,

Lao/Mien and Vietnamese participating in the WSU Food Gardening Project.

2. 150 nursery staff, landscape professionals and horticultural students attended 23 presentations on Green Gardening practices.

3. 375 landscape professionals attended an all-day IPM workshop. 212 evaluation forms were returned with 70% of the responses indicating "outstanding" or "very useful" ratings for the workshop.

4. 88 individuals (74 Seattle groundskeepers) attended a one-hour training session on practical Integrated Pest Management techniques, including alternative weed management strategies.

5. 92 Master Gardeners were given three hours of training in Green Gardening techniques.

6. Six "Practical Gardener" columns focused on Green Gardening techniques ran in the Seattle Times.

Carl Woestwin (206) 684-4684

Natural Lawn Care Program

(See Section 5.D for details.)

L. ILLICIT DISCHARGES (S7.B.8.g)

Investigation of illicit discharges and improper disposal of materials to surface water is handled by the Surface Water Quality Team as part of their investigations program (See Section 5.B). In 2000, investigation of an oily discharge in one north Seattle storm drain resulted in the discovery of a leaking underground storage tank that was discharging heating oil to the City storm drain system via the property's footing drainage system. The heating oil tank was replaced. Also, an interior floor drain at another north-end maintenance facility was found to be incorrectly plumbed to the storm drain system. The problem has also been corrected.
Beth Schmoyer (206) 615-1636

M. CONTROL OF INDUSTRIAL DISCHARGES INTO MS4S (S.B.8.h)

As part of the City's Water Quality Source Control, Complaint Investigation, and Monitoring Program, evidence of stormwater contamination is investigated by the Surface Water Quality Investigators.

2. CHANGES IN PERMIT COVERAGE AREA:

There were no changes in permit coverage area in 2000, and none are anticipated in 2001.

3. EXPENDITURES FOR STORMWATER PROGRAM (S7.B.5):

In July of 1999, Seattle implemented a new financial management program called Summit. The primary driver behind the Summit Project was the year 2000 problem, which necessitated replacing the previous financial management program (Seattle Financial Management System, or SFMS). Transitioning from SFMS to Summit required developing an entirely new set of organizational, accounting, and activity cost

codes. On one hand, the new coding structure allows for a much more detailed accounting of budgeted and actual costs incurred than the previous system. However, in many cases, specific stormwater program costs remain blended with other stormwater programs costs, making an accurate categorical breakdown difficult. This is the second NPDES Annual Report provided to Ecology that used Summit to derive estimates of expenditure.

The estimates provided in Table 8 show the budgeted and actual overall stormwater management program budget for 2000. In many cases, owing to the internal organization of SPU, many general management and support functions are jointly funded by drainage, drinking water, wastewater and solid waste funds. In these cases, an assumed fraction of the total costs (typically 25% - 30%) was allocated to stormwater programs. It is not intended that these estimates serve as a modification of budget estimates made in previous reports. Instead, these estimates should be viewed as a refinement of the estimate provided in last year's report, but still a macro-scale analysis of stormwater program operating costs.

Table 8. Overall Stormwater Management Program Budget

Program	2000 Budgeted	2000 Actual
Drainage O&M	$ 5,011,000	$ 4,199,000
Street O&M	$ 1,580,000	$ 1,553,000
Source Control/Pollution Prevention Programs	$ 447,000	$ 447,000
Public Education Programs	$ 683,000	$ 534,000
Regulatory Development & Enforcement	$ 334,000	$ 615,000
Monitoring Program	$ 245,000	$ 263,000
Other Stormwater Program Costs	$ 1,096,000	$ 1,813,000
Overall Stormwater Program Budget	**$ 9,396,000**	**$ 9,424,000**

Drainage O&M: Includes SPU Field Operations Branch budgets for drainage inspection, drainage cleaning, and drainage repair, and an estimated portion of the overall branch support costs. Also included are expenses related to Conservation Corps and spot drainage program conducted by SPU.

Street O&M: Includes SEATRAN budgets for mechanical street sweeping, street flushing, alley flushing, snow/ice response and bridge drain repairs. Note that budgeted amounts for SEATRAN were only available for bridge drain repairs, so actual costs are used in both columns for the other street maintenance activities. Not included in the above table are budgets for litter pick-up (approximately $1.4 million) and illegal dumping (approximately $500,000).

Source Control/Pollution Prevention Programs: Includes estimated costs for water quality complaint response, private detention inspections, business inspection, natural lawns program, and green gardening program.

Public Education Programs: Is based on the Water Quality Education budget for SPU Community Services Division, which includes activities that are both directly and indirectly related to stormwater education.

Regulatory Development & Enforcement: Includes SPU Resource Planning Division costs for regulations, and SPU funds provided to SEATRAN to support development and redevelopment permit processes. Increase over 1999 reflective of costs involved to revise the City's Stormwater Code.

Monitoring Program: Includes an expenditures for monitoring conducted by SPU Community Services Division, plus cost associated with grant-funded monitoring projects. In most cases, budgeted values

were not available, so actual expenditures used in both columns.

Other Stormwater Program Costs: Includes estimated proportions of general program management and other support costs.

Robert Chandler (206) 684-7597, Trisha Erickson (206) 684-8082

4. REVISIONS TO FISCAL ANALYSIS

In accordance with Section S9 of the permit, a permit modification is required if there is a greater than 20-percent difference between the *projected* annual budget values contained in the City's SWMP (Table 9.7 in the 1997 SWMP) and the actual budget *adopted* by the City Council. The City of Seattle increased its stormwater budget for biennial fiscal years 1999 and 2000 by approximately 39-percent. The increase in funding was the result of a drainage rate increase, which was approved in December 1998 and became effective in January 1999.

5. COMPLIANCE ACTIVITIES

In the interest of monitoring and ensuring the success of the SWMP, the City conducts enforcement actions, inspections and investigations of businesses throughout its jurisdiction.

A. ENFORCEMENT ACTIONS

SPU's Surface Water Quality Team continues to pursue a policy of public awareness and education as the preferred approach to ensuring compliance with city ordinances. Staff rely on a combination of site visits, telephone contacts, and follow-up letters to educate potential drainage code violators about best management practices to protect stormwater quality. A review of water quality complaint data indicated that there were only 24 repeat offenders (based on location of violation) out of over 650 water quality complaints received between January 1995 and June 1999.
Laura Reed (206) 615-0551.

B. INVESTIGATIONS

SPU relies on citizens to spot and report potential surface water problems, and SPU water quality field investigators respond to water quality-related complaints within the City limits. The complaints originate from two sources: citizens who call the City's hotline (684-7587) and referrals from other departments and agencies. When the team responds to a complaint, every attempt is made to determine the responsible party and stop the action that is polluting the surface water. Inspectors also provide information on clean-up, alternative disposal options, erosion control, and other best management practices. If practical, the responsible party is required to clean up the material. When necessary, the field crew requests that City maintenance crews sweep the street, clean catch basins, or perform other cleanup. All complainants, if accessible, are notified of investigation results.

SPU water quality investigators received 292 surface water quality complaints in 2000 and 162 between January 1 and June 30, 2001. Staff conducted on-site investigations at 259 sites in 2000 and 132 sites as of June 2001. A summary of water quality complaints received during 2000 and the first 6 months of 2001 is provided in Table 9.

Table 9. Summary of Water Quality Complaints

Type of Action	January 1 to December 31, 2000	January 1 to June 30, 2001
Water Quality Complaints	292	162
Site Visits	259	132
Letters sent	7	1
Referrals	40	16
Resolved	238	103
Ongoing	0	59
Unresolved	54	59

In 2000 and 2001, the most frequent water quality complaint concerned discharge of automotive fluids, particularly motor oil (27 percent), followed by sediment, paint, and other chemicals (10 percent each). Unknown materials constituted 42 percent of the complaints received in 2000 and the first half of 2001. As part of the resolution process, letters were sent to seven alleged violators in 2000 and one alleged violator in 2001, noting the problem(s) and stating the necessary actions to resolve the problem(s). A total of 56 cases were referred to other departments or agencies, such as Seattle Police Department, SPU Illegal Dumping, SPU Drainage and Wastewater Operations, SEATRAN Street Use Department, Seattle Department of Design Construction & Land Use, the U.S. Coast Guard, Ecology, EPA, and King County. (Note that referrals are considered as "resolved" investigations by SPU unless additional action is required by the Utility.)

In order to determine the effectiveness of the surface water quality team complaint response program, the team will provide a follow-up survey to customers who call in surface water quality complaints. A performance target of 80-percent satisfaction with customer service has been established. In this way, the team will be able to assess the performance of the complaint resolution process. In 1999, the water quality complaint data base was linked with the City geographic information system (GIS) to map complaints received through June 1999 by location and by type of problem (e.g., sediment, automotive fluid, paint, and other chemical). GIS mapping can now be used to track surface water complaints.
Beth Schmoyer (206) 615-1636

C. INSPECTIONS

Business inspections

(See 1.G for details on this aspect of the source control program)

Permitting, Plan Review and Inspection

Beginning in September of 2000, SPU launched an effort to enhance the implementation of permitting, plan review and inspection related to stormwater requirements. After staff analyzed existing procedures, an interdepartmental management summit was held in November 2000 and participants concluded that the stormwater permitting should be consolidated under the Department of Design, Construction and Land Use (DCLU). This consolidation will bring the plan review, permitting and inspection for erosion and sediment control, critical areas protection and permanent stormwater controls within one team, thereby enabling the City to better manage soil, water and vegetation during and after the development of a site. This transfer is expected to provide the skill set necessary to administer the new requirements of source control, treatment and to evaluate the additional flow control options. The transfer is expected to be completed by January 2002.
Miranda Maupin 206-386-9133

Private Stormwater Detention System Inspections

Inspections of privately-owned stormwater detention systems began in 1991. To date, SPU staff has inspected 2,033 of these systems. Inspections have focused on commercial and industrial properties. Detention systems serving single family residences have not been inspected. There are 962 known single family residential systems and an estimated 200 additional systems belonging to single family homes that have not yet been captured in the database. A system for capturing new systems as they are built has been developed. As the plans for these new sites with stormwater detention become available, they are inspected. The initial canvass of the city has been completed, and files have been created for all sites. The total number of privately-owned systems in Seattle is estimated to be 3,250 (with a confidence range of +/- 200).

In 2000, 617 inspections were completed, and an additional 399 inspections were completed during the first 6 months of 2001. A summary of the types of facilities inspected in 2000 and the first half of 2001 is presented in Table 10 below:

Table 10. Types of Detention Facilities Inspected in 2000/2001

Structure	2000	1st half 2001
Flow control structures	706	497
Catch basins	1654	1144
Ponds	5	10
Vaults	30	11
Pumps	54	32

The distribution of privately-owned systems inspected in 2000 and 2001 by land use served is shown below:

49 percent multi-family
45 percent commercial
6 percent other (parking lots, parks, public property, etc).

Out of the 1016 inspected sites in 2000 and 2001, 56 percent were in need of some level maintenance. Removal of sediment from flow control structures and/or onsite catch basins was the most common maintenance need. Only three-percent of attempted inspections were unresolved, mostly due to difficulty accessing private property.

In 2000, 71 percent of the property owners performed the necessary maintenance within 90 days of the initial inspection, and in the first half of 2001, the 90-day compliance rate has was 54 percent.
Laura Reed (206) 615-0551

D. EDUCATION ACTIVITIES (SECTION S7.B.8.i)

Best Management Practices for Seattle Transportation Department

SPU hired the Environmental Coalition of South Seattle (ECOSS), a non-profit environmental firm, to work with the Seattle Transportation Department (SEATRAN) to implement stormwater BMPs. ECOSS staff met with several asphalt, paving and concrete crews in the field to examine work practices. ECOSS held water quality training for these crews. In addition, SPU will provide spill response kits to SEATRAN trucks in 2001. ECOSS staff toured four SEATRAN field offices and made recommendations for improving outdoor storage and housekeeping. The housekeeping changes have

been implemented. Several of the structural recommendations will be addressed as SEATRAN updates the yard and facilities.
Chris Woelfel (206) 684-7599

Environmental Quality in Construction Program for Seattle Public Utilities

In early 2000, the City conducted focused training for SPU staff involved in planning, design, management, construction and other environmental aspects of capital projects. Designated the Environmental Quality in Construction (EQC) Program, the purpose of the training was to achieve the highest possible environmental performance during the construction phase of SPU capital and infrastructure projects. Phase 1 of the three-phase program was conducted in February 2000 and involved an overview of the Endangered Species Act and other permitting requirements. Phase 2, conducted in March 2000, focused on the importance of construction erosion and sedimentation control, roles and responsibilities, and ensuring minimum requirements for stormwater pollution prevention plans are met at SPU construction sites. The third phase is ongoing and involves a two-pronged effort toward ensuring environmental quality in construction: (1) establish a team approach to individual projects, where project managers, construction managers, environmental staff and other key players meet and discuss the environmental sensitivities and regulatory requirements governing each project before going to construction; and, (2) provide recurring technical training for project and construction managers in on-site construction and source control BMPs.
Jay Laughlin (206) 684-5927

Baseball Cards for Urban Creeks

In 2000, SPU developed Creek Cards. Creek Cards look like baseball cards, but instead of information on home runs and stolen bases, Creek Cards feature statistics on water quality, wildlife, and stewardship. The data can be easily collected by staff or volunteers. The cards provide a compact and fun progress report. Seattle Public Utilities has developed Creek Cards as a tool to inform local residents of the importance of being involved in protecting watersheds and to let them know the results of various watershed protection activities in their neighborhood. Creek Cards are easy to update, and an individual card can be developed for each stream in the jurisdiction.
Chris Woelfel (206) 684-7599

Household Hazardous Waste Program

The City of Seattle is represented in the regional Local Hazardous Waste Management Program (LHWMP) in King County by SPU as one of the five key partners. Through this program, SPU provides a number of Household Hazardous Waste (HHW) education and collection services. The Program provides numerous services for households and small quantity generators (SQGs) of hazardous wastes (as defined by WAC 173-303).

Among the longest operating HHW collection facilities in the U.S., Seattle's two HHW facilities collect material for proper disposal. Suitable materials—mostly latex paint and automotive products—are collected and then given away to be used by the general public or by other City departments. Some of the latex paint, antifreeze, and motor oil are recycled; other products, such as household cleaners, are properly disposed of as hazardous waste. In 2001 SPU began a one year pilot program to collect HHW waste from homebound citizens.

HHW collection facility staff are active community educators, both on and off site. The collection facilities sport colorful education shelters that are equipped with displays and brochures. Knowledgeable staff are available to field numerous questions from the public and to encourage waste reduction and safe handling practices. Staff also participate in public events, such as the Seattle Home Show, where they

provided information to thousands of attendees. HHW collection services are only one aspect of the City's program, which seeks to emphasize waste reduction and to reduce exposure to potentially harmful material. SPU delivers several innovative programs, which reach several thousand people each year through promotional measures and face-to-face activities. Examples include:

- Green Gardening program, involving nursery staff and master gardeners in educating the public about gardening practices that reduce chemical use, toxic runoff, and water use;
- Natural Lawns program, demonstrating resource-efficient and less toxic methods for maintaining healthy turf;
- Green Cleaning program, distributing lower toxicity cleaning products and simple recipes for common household cleaning jobs. Over 2000 kits were distributed to schools, new parents, under-served communities, and to the general public.
- Environmental Justice Pass-It-On program, where SPU conducted an EPA-funded project which involved training adults and youth from under-served communities in Southeast Seattle on HHW and environmental justice issues. Fifty four people participated in the training and outreach services were provided to over 500 people

Kathy Minsch (206) 615-1441

Storm Drain Stenciling Program

SPU's Storm Drain Stenciling Program places the message " Dump no Waste, Drains to [Stream, Lake, Bay]" next to inlets Table 11 summarizes 2000 activities throughout the city:

Table 11. Storm Drain Stenciling in 2000

Community Group	No.	Community Group	No.
Seattle Public Schools	765	SPU Earth Day	81
North Seattle Community College	57	Pipers Creek Earth Day	89
Shoreline Community College	44	Seattle Private Schools	102
Seattle Pacific University	71	Puget Sound Car Wash Association	153
University of Washington	49	Seattle Summer Community Festivals	103
West Seattle YMCA	31	Seattle Block Watch Programs	237
Seattle Boy/Girl Scouts	123	Internat'l District Asian Counseling Service	87
Community Organizations/Businesses	97	Seattle Parks/Rec Summer Programs	179
		Total	**2268**

Carlton Stinson (206) 684-7624

Salmon in the Classroom

2000 was the tenth year of the Salmon in the Classroom program, which uses the process of raising salmon as a teaching tool. The goals of SPU's Salmon in the Classroom program include providing education on clean water and watershed-related issues, increasing community stewardship of watersheds, and developing water quality partnerships between community and businesses. In a many-faceted education program, salmon are used as the focal point to teach about the importance of clean water and watersheds. This six-month long salmon raising project gets teachers and students involved in the enhancements of water quality, habitat, conservation and stewardship for Seattle's streams, lakes and Puget Sound. The program is provided to 115 Seattle schools and touches over 30,000 students.
Carlton Stinson (206) 684-7624

Salmon Friendly Gardens

Northwest Flower and Garden Show: Providing Inspiration for Behavior Change

In February 2000, SPU unveiled a walk-through display garden at the Northwest Flower and Garden Show. SPU's goal was to demonstrate that individual gardeners can have a positive impact on salmon recovery, no matter how near or far they live from the water. Many gardeners made the connection for the first time between what they do in their garden and potential impacts on salmon. All of the recommended gardening practices could help salmon as well as bring about additional environmental benefits. The display demonstrated designs and practices that conserve water, reduce stormwater runoff, decrease pesticide and fertilizer-caused pollution and protect and increase habitat. In addition to the display garden, SPU developed the brochure, "How to be a Salmon Friendly Gardener" and hosted a slide-show presentation during the show to provide an overview of practical gardening steps for the "salmon friendly gardener." Approximately 18,000 brochures were picked up by display visitors. Over 74,000 people attended the five-day show.
Liz Fikejs (206) 615-0516

Partnering in the Community for Continued Outreach

Following the Northwest Flower and Garden Show, SPU continued outreach efforts through several venues. Staff worked with nonprofit organizations (Seattle Tilth, Seattle Audubon, Master Gardeners, etc), nurseries, water purveyors, educational forums (South Seattle Community College, Third Place Books, Washington State Recycling Association) and local residents to create educational displays at events, distribute the "How to be a Salmon Friendly Gardener" brochure in point-of-purchase areas, provide classes and serve on discussion panels. In addition, staff have assisted Kitsap and Snohomish Counties and the City of Vancouver in tailoring the salmon friendly gardening brochure to other Puget Sound Area residents. Six months after the Flower and Garden Show, brochure requests continue to come from residents, agencies, schools, nurseries and nonprofit organizations. To date, SPU has distributed over 40,000 copies.
Liz Fikejs (206) 615-0516

Investigating Feasibility of a Targeted "Salmon Friendly" Audit Program

Next steps in the "Salmon Friendly" program may include researching and implementing a salmon friendly gardening audit program. The audit program would target residents living along shorelines (creeks, lakes and Puget Sound) with the overall goal of:

- Reducing stormwater pollution;
- Reducing stormwater runoff;
- Preserving or improving buffers; and,
- Reducing outdoor water use.

While most elements of "salmon friendly gardening" are applicable to all residents regardless of their proximity to shorelines, residents living along water edges have a more immediate impact through their use of outdoor chemicals, contribution toward excess stormwater runoff, and removal of habitat buffers. Prior to implementation, SPU will perform a feasibility analysis to identify cost-effectiveness, potential implementation obstacles, possible efficiencies with existing programs, incentives for behavior change, regional partnerships and other elements. Dependent on the outcomes of this first research phase, SPU would then proceed to pilot the audits.
Liz Fikejs (206) 615-0516

Green Gardening Program

(refer to section 1.K)

Natural Lawn Care

The Natural Lawn Care Campaign was begun in 1997 as a way to encourage residents to use environmentally-friendly lawn care practices. Seattle Public Utilities staff did extensive research on natural lawn care practices. The resulting report, *Ecological Lawn Care for Western Washington*, formed the basis for campaign recommendations. The campaign is primarily media-related, with paid advertising and media relations activities being the basic strategies. In 2000, a new Natural Lawn Care TV ad was played on 73 televised Seattle Mariners games. In addition, a "Natural Lawn Care neighborhood" was selected in Renton. 20 residents were supplied with mulching mowers, organic fertilizer, and pest management and irrigation tools. The media work around it was designed to highlight the neighborhood as a test of Natural Lawn Care techniques. Also in 2000, a Natural Lawn Care theme was brought into the Mower For Less regional mulch mowers sales. Over 2,000 long-handled weeding tools were sold successfully to residents, with the purpose of lessening the use of lawn herbicides.
Carl Woestwin (206) 684-4684

6. KNOWN CHANGES IN WATER QUALITY

Based on the City's data, there were no known significant changes in the water quality of the City's receiving water bodies.

7. STATUS OF WATERSHED-WIDE COORDINATION (S7.B.7a)

The City of Seattle is involved with the following groups to forward watershed-wide intergovernmental coordination of projects and planning efforts.

WATERSHED RESOURCE INVENTORY AREA (WRIA) PLANNING

The City of Seattle has been actively involved in Watershed Resource Inventory Area (WRIA) planning for WRIA 7 (Tolt/Snohomish), WRIA 8 (Cedar/Lake Washington), WRIA 9 (Green/Duwamish), WRIAs 3 & 4 (Upper & Lower Skagit), and WRIA 62 (Pend Orielle). SPU has two full-time, senior-level WRIA coordinators (WRIA 8 & 9), and Seattle City Light has allocated three staff to WRIA Planning (WRIA 3 & 4, WRIA 7 and WRIA 62). WRIA planning efforts work to build inter-jurisdictional coalitions and to integrate city-wide efforts within each WRIA. The WRIA planning bodies have focused planning agendas on developing baseline salmon habitat assessments and recovery plans, which have included identifying watershed-wide informational needs and limiting factors to salmon recovery.

WRIA 8 and 9 completed their baseline assessments in 2000 and early 2001. WRIA 8 and 9 were again successful in gaining project funding from the State Salmon Recovery Funding Board (SRF). WRIA 9 projects were in the middle Green River and on the Puget Sound nearshore. WRIA 8 projects were on the Cedar River and on Rock Creek and Upper Bear Creek. The City of Seattle contributed $100,000 to an important land acquisition project in the City of Tukwila which had been partially funded by a previous SRF Board grant. In the coming year, the WRIAs will be active in coordinating inter-jurisdictional prioritization and funding for salmon habitat restoration. The WRIA coordinators will help integrate the City's activities and programs with basin-wide salmon health and water quality goals.

Scott Powell, WRIA 7 (206) 386-4582; Keith Kurko, WRIA 8 (206) 233-1516; Judith Noble, WRIA 9 (206) 684-8078; Ed Connor, WRIAs 3&4 (206)615-1128; Al Solonsky, WRIA 62 (206) 386-4580.

WATERSHED FORUMS

The City of Seattle elected officials and staff have participated in four local Watershed Forums (Green/Duwamish, Cedar/Lake Washington, Snoqualmie, and Central Puget Sound) since the inception of these forums several years ago. The Forums are an outgrowth of the Regional Needs Assessment for surface water management, and were originally formed to address surface water management needs, including flooding and water quality. They were later expanded to specifically address salmon and related riparian and aquatic habitat issues. In each watershed, projects have been identified and prioritized that address priority needs. In 2001, these Forums became aligned with the WRIA planning process. An interlocal agreement was signed through which all jurisdictions are financially supporting the WRIA planning process. King Conservation District funds, allocated through the Forums, will support projects for salmon recovery, in some cases supplying the local match for Salmon Recover Funding (SRF) Board grants.

Seattle has been a supporting member of the Green/Duwamish Ecosystem Restoration Study being undertaken by the Army Corps of Engineers. The general investigative study has been completed, the feasibility analysis has just ended, and the programmatic EIS has completed its review cycle. This study proposes approximately 50 habitat projects which will increase habitat forming process in the Green/Duwamish and increase ecosystem health.

Seattle has been supporting extensive research on salmon in the Lake Washington/Ship Canal portion of the Cedar River system. This research will help to establish a basic understanding of how salmon use these aquatic environments within the City and also how bass, thought to be a major predator on salmon, also use the City's shorelines. This research will help guide the City's ESA actions and will be important in evaluating the impacts of City stormwater projects on salmon.

Scott Powell, WRIA 7 (206) 386-4582; Keith Kurko, WRIA 8 (206) 233-1516; Judith Noble, WRIA 9 (206) 684-8078; Ed Connor, WRIAs 3&4 (206)615-1128; Al Solonsky, WRIA 62 (206) 386-4580.

CENTRAL PUGET SOUND SUBFORUM

The Central Puget Sound Watershed Subforum (CPSWS) addresses marine resources in the Watershed Resource Inventory Areas (WRIAs) 8 and 9, the Green/Duwamish watershed and the Lakes Washington/Sammamish watershed, respectively, and works with representatives from both WRIAs. The CPSWS has a Nearshore Technical Committee (NTC), consisting of regional experts to help define what is known about the marine nearshore and what information is needed. The NTC has just produced a report identifying existing knowledge and functions of the marine nearshore. This report can be used to identify and prioritize projects, research needs, and beneficial salmon recovery efforts.
Gail Arnold (206) 684-7613

LOWER DUWAMISH SEDIMENT CLEANUP AND RESTORATION

Staff of SPU are members of the multi-jurisdictional Elliott Bay/Duwamish Restoration Panel (EBDRP). EBDRP includes representatives from NOAA, US Fish and Wildlife, the Muckleshoot and Suquamish tribes, the Department of Ecology, King County and the City of Seattle. It prioritizes and funds clean-up and restoration projects on the Duwamish. It has funded a clean-up project at the Norfolk site, removing 5500 cubic yards of contaminated sediment for disposal. Habitat projects include habitat restoration at the Seaboard Lumber site and other locations. Starting in 2003, EBDRP will be remediating a contaminated sediment site off the Diagonal/Duwamish storm drain/CSO. Just prior to that effort, the City will clean the outfall and associated lines of accumulated sediment. The City has also done inspections of potential sources of contamination contributing to these outfalls.

The City is also preparing a Remedial Investigation and Feasibility Study of the Lower Duwamish in partnership with King County, the Port of Seattle, and Boeing. This is being done under an Agreement on Consent (AOC) with EPA and Ecology. The first Phase of this work will be completed in early 2002, and will include the identification of priority sites for early action on sediment remediation.
Martha Burke (206) 684-7686

LAKE WASHINGTON SHIP CANAL GENERAL INVESTIGATION STUDY

SPU, King County, and the Corps of Engineers are sponsoring a multi-agency study for water conservation/management and salmon restoration in the greater Lake Washington Basin (WRIA 8). SPU is the local sponsor for water conservation/management, fish passage, and juvenile salmon habitat studies at the Hiram A. Chittenden Locks, Lake Washington Ship Canal, and Shilshole Bay. Water conservation studies include evaluating methods of more efficiently operating the Locks and improving flows and water quality for salmon, especially chinook. Adult and juvenile salmon studies are to improve their migration through the Locks and for restoration of modification of habitat(s) for salmon survival improvements, as well as, identification of possible operational changes at the Locks. The studies will be conducted for several years and a feasibility study report is scheduled by 2005 which is followed by operational and/or construction improvements. Key information is being obtained juvenile salmon migration in the basin.
Gail Arnold (206) 684-7613, Keith Kurko (206) 233-1516

8. OTHER ACTIVITIES

Although not specifically required under the NPDES permit process, the programs described in this section represents the City's proactive stance toward stormwater management issues, environmental stewardship, and public participation.

URBAN CREEKS INITIATIVE

The following briefly summarizes major endeavors by the Urban Creeks Legacy Team in 2000.

Capital Improvement Projects & Programs 2000:

Thornton Creek
Work at four sites was completed in 2000, including additional rock weirs to allow fish passage; replacement of gabions (bundles of rocks) with woody debris to improve fish passage and habitat; revegetation with native plants; and a walking path re-sited away from the creek to plant native vegetation for shading.

Longfellow Creek
In-stream and upland projects at Yancy Street were completed in 2000, as well as reforestation and the "Fish Bridge" art installation. The new culvert entrance at Genesee Street proved successful to fish passage as our monitoring teams found many spawning salmon in the West Seattle golf course.

Taylor Creek
SPU is continuing design on improvements to open fish passage beyond several barriers on Taylor Creek including the culvert that runs under Rainier Avenue South. SPU is working to purchase a key property in 2001 to accommodate a design that will allow more open creek channel designs without an increase in budget. Cascadia Quest work included informal trail removal, invasive removal, formalized creek access, and erosion mitigation structures.

Pipers Creek
The major focus in 2000 was reforestation of creek ravines and monitoring of CIP in-stream sites.

Other Creeks Activities
SPU staff physically surveyed all the secondary creeks in Seattle. The information will be updated on GIS maps and used to direct policy for when and where SPU has drainage responsibility. This is also baseline information for CIP development in our smaller creek systems. Cascadia Quest (CQ) and the Seattle Conservation Corps (SCC) removed 6000 invasive shrubs in creek ravines this year SCC planted and removed invasive weeds for eight weeks along Mapes Creek and Schmitz Creek. CQ repaired a two-year old landslide in Fauntleroy Park ravine. Both worked closely with local creek groups such as Friends of Fauntleroy Park and Friends of Deadhorse Canyon. CQ recruited construction help from Consejo Youth.

Partnership Work:

2001 Creekside Living Workshops: This year the focus was on erosion control, bank stabilization, landscaping, native plants, and related issues identified through a survey mailed to creekside residences. The survey had an excellent return mailing of about 10% showing strong interest in creek issues. Several hundred citizens attended workshops.

Volunteer Program: In 2000, we developed an urban creek stewardship strategy that included a new a new stewardship coordinator, hired in June of 2001, and series of special events for businesses and kids. In 2001, the program will train creek team leaders.

For Urban Creeks Legacy: Denise Andrews (206) 684-4601

URBAN CREEKS AND WATERSHED STEWARDSHIP

SPU has developed a new urban creek stewardship program to help support the Urban Creek Legacy projects. The focus of the program is to involve the community in taking care of its creeks and to educate residents on the value of creek ecosystems and the impacts of human activities.

Teams of volunteers from local neighborhoods—residents, businesses, non-profits, and schools—will be recruited to support planting native plants, weeding of invasive species such as ivy and blackberries, watering native plants, and collecting data in reaches of urban creek watersheds throughout the city. Volunteer team leaders will be trained to help lead these teams. SPU funded a new urban creek steward position, which was filled in May 2001, and allocated additional funding to start the program. SPU will continue to expand partnerships with the Department of Parks & Recreation (Parks) and with local communities, and will continue to support established work parties and special volunteer events. Highlights of accomplishments from January 2000 through June 2001 included:

- Partnered with Nickelodeon, ATT and Parks to bring the *Big Help* to Seattle in October 2000. Over 800 volunteers turned out for work parties at seven sites around the city. The city received 4,400 native plants and several hundred tools.

- Annual *Day of Caring* event in September 2000, which was conducted in partnership with King County United Way and involved four businesses who will continue to partner with the City in the future.

- Formed new partnership with Bank of America environmental stewardship program. Sponsored workshop on salmon-friendly gardening and two work parties in the creeks involving Bank of America volunteers.

- Participated in planning and support of *Creek Week 2000* in cooperation with Parks and other

SPU staff. Included staffing and displays at work parties and at celebrations in major creek watersheds, resulting in 700 new volunteers signing up

- Coordinated with Parks and local communities on several *Earth Day 2001* Creek Week volunteer work parties in four watersheds involved with plantings native and weeding invasive species.

- Funded airing of the Longfellow Creek Video at a community movie theater from December 2000 through June 2001, and recruited 50 new volunteers.

- Funded a community group to develop a community-based watershed plan for Fauntleroy Creek, resulting in creation of a new watershed council to oversee its implementation.

Kathy Minsch (206) 615-1441